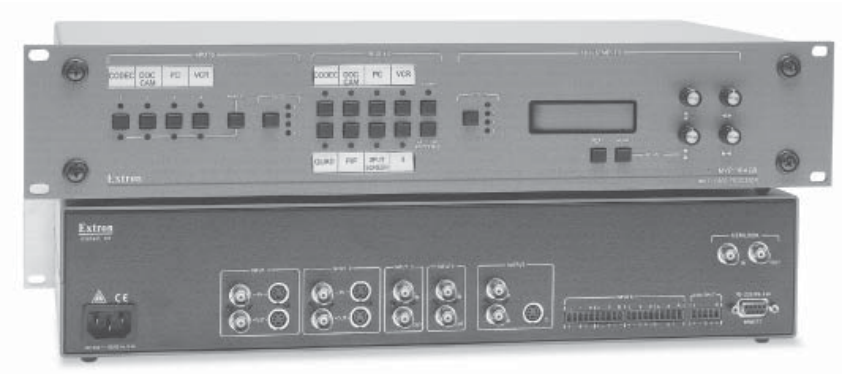
Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

User's Manual



MVP 104GX

Multi Video Processor

68-484-01
Printed in the USA

Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions • Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions • Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Avertissement

Alimentations • Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation • Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Objekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Quick Start — MVP 104GX

Installation

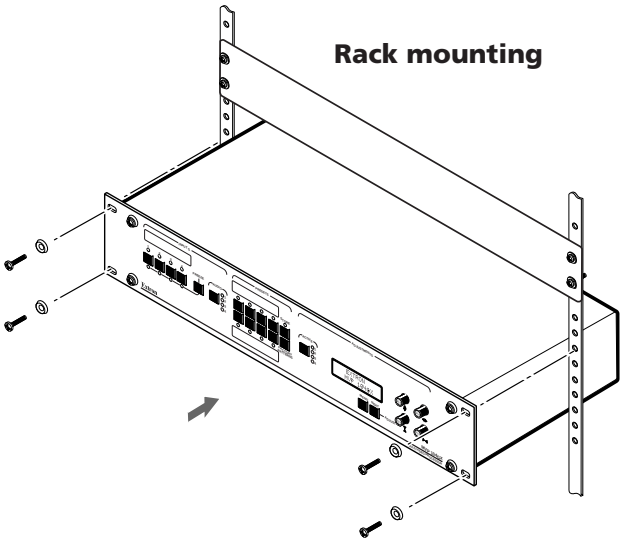
Step 1

Turn off power to the MVP 104GX and all other devices that will be connected.

Step 2

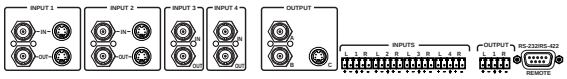
If the MVP 104GX is to be rack mounted, insert the mounting screws and washers, as shown on the right.

Rack mounting



Step 3

Using Inputs 1, 2, 3, and 4, attach up to four composite/S-video input devices to the MVP 104GX. Inputs 1 and 2 can be either composite video or S-video, inputs 3 and 4 are composite video only.



NOTE *Any inputs must be either **all** NTSC or **all** PAL, they cannot be both.*

The buffered loopout connectors for all inputs can be used to output the identical signal to other devices. See the application connection diagram on the right.

Step 4

Connect up to three output devices to the MVP 104GX using composite video output A, composite video output B, and S-video output C.

Step 5

For stereo audio input, connect up to four audio sources to audio inputs 1, 2, 3, and 4. See the *Audio input and output* section in chapter 2 for illustrations and warnings.

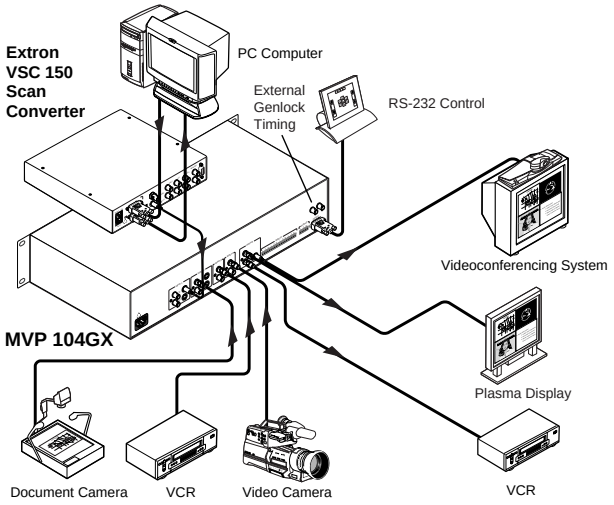
Step 6

For stereo audio output, connect an audio output device to the 3.5 mm stereo audio output connector. See the *Audio input and output* section in chapter 2 for illustrations and warnings.

Step 7

If the MVP 104GX is to be connected to a computer or host controller for remote control, connect the host's RS-232/RS-422 cable to the 9-pin female RS-232/RS-422 remote connector of the MVP 104GX. For an RS-232/RS-422 pinout table, see the *Remote Control Port (RS-232/RS-422)* section in chapter 5.

Connecting the MVP 104GX



If a genlock device is to be connected to the MVP 104GX, see *Setting Up Genlock and Vertical Interval Switching* in chapter 2.

NOTE *The MVP 104GX comes from the factory already configured for RS-232. To set the MVP 104GX for RS-422 operation, refer to "Configuring the MVP 104GX for RS-422" in the appendix.*

Step 8

Power up the input and output devices, then connect power to the MVP 104GX. A summary of the menu system is described on the following page. See the appropriate chapters in this manual for further details.

Menu Operation

Default Cycle menu

On power up of the MVP 104GX, a default cycle of two informational submenus displaying the product name and product type will appear in 2-second intervals. While in this cycle, all selected **Input** button LEDs will light green.

To adjust any active window's sizing or positioning, press the appropriate **Active window selection** button.

Position/Size window menu

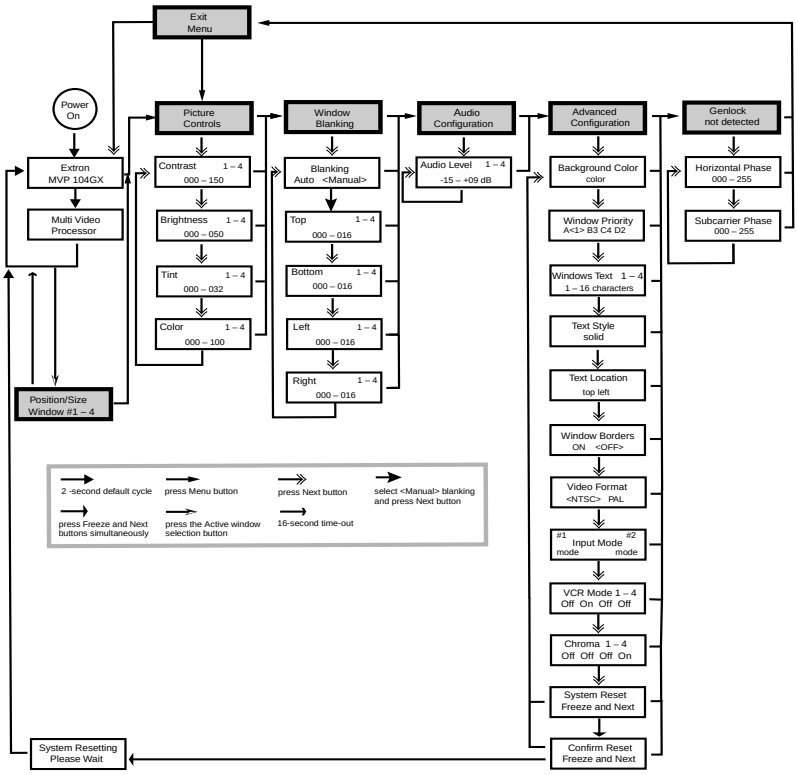
The active window can be sized and positioned either vertically or horizontally by adjusting the appropriate sizing and positioning knobs (see the *Adjustment knobs* diagram below). Press the **Menu** button to advance to the Picture Controls menu.

Picture Controls menu

The Picture Controls menu allows you to adjust the contrast, brightness, tint, and color of a window image by rotating the **Vertical sizing** knob. Press the **Active window selection** button to select a window. Press the **Next** button to advance to the Contrast, Brightness, Tint, and Color submenus, or press the **Menu** button to exit the Picture Controls menu/submenus and advance to the Window Blanking menu.

Window Blanking menu

Select a window by pressing the **Active window selection** button. The Window Blanking menu adjusts the top, bottom, left, and right blanking of each output window. Press the **Next** button to advance to the Blanking submenu. Rotate the **Vertical sizing** knob to select <manual>, then press Next to advance to the Top, Bottom, Left, and Right submenus. Rotate the **Vertical sizing** knob to adjust the blanking. Press the **Menu** button to exit the Window Blanking menu/submenus and advance to the Audio Configuration menu.



Audio Configuration menu

The Audio Configuration menu consists of an Audio level submenu which adjusts a window's audio level. Press the **Next** button to advance to the Audio Level submenu, or press the **Menu** button to exit the Audio Configuration menu and proceed to the Advanced Configuration menu.

Advanced Configuration menu

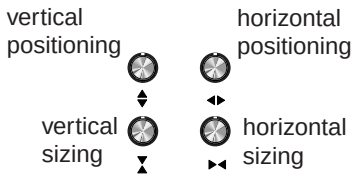
The Advanced Configuration menu allows adjustment of the background color, window priority, window text, window borders, and video format of the window image by rotating the **Vertical sizing** knob (rotate the **Horizontal sizing** knob when shifting through the text in the Window Text submenu). The advanced configuration settings are displayed on the bottom of the LCD panel.

System reset and confirm reset submenus can also be accessed from this menu. Press the **Next** button to advance to the Background Color, Window Priority, Window Text, Text Style, Text Location, Window Borders, Video Format, Input Mode, VCR Mode, Chroma, and System Reset submenus, or press the **Menu** button to exit the Advanced Configuration menu and proceed to the Exit menu.

Exit menu

Press the **Menu** button to return to the default cycle submenus, or press the **Next** button to return to the Picture Controls menu.

Adjustment knobs



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68-484-01 **Rev. C**
Printed in the USA
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Chapter One

Introduction

About the MVP 104GX

MVP 104GX Features

Introduction

About the MVP 104GX

Extron's MVP 104GX is a multi video processor featuring four inputs, three outputs, audio switching, and genlock capability. The MVP 104GX accepts up to four video inputs, both composite and S-video, and can simultaneously output all four video sources to a single output device. Each of the three outputs can display up to four discrete, scalable windows, one for every input source. This windowing feature allows the MVP 104GX to be used in various applications, including videoconferencing and security operations. The windows can be configured using both factory pattern preset and user-defined configurations that include window positioning, sizing, blanking, priority, and audio input selection.

The MVP 104GX features an LCD front panel and a menu system that are accessible through front panel buttons and RS-232/RS-422 remote commands.

MVP 104GX Features

Multiple inputs — Two inputs can be either composite (NTSC or PAL) or S-video. Two additional inputs are composite-only. All inputs have a buffered loopout available through an identical loopout port.

NOTE *Any inputs must be either **all** NTSC or **all** PAL, they cannot be both.*

Multiple outputs — Three outputs for simultaneous display on two composite video and one S-video devices.

Scalable windows — Up to four window images, one for each input, can be sized and positioned on each output display device. Each window can also have its own user-specified text description.

Picture controls — Horizontal and vertical sizing, positioning, contrast, brightness, tint, color, and blanking controls are available for each window.

Blanking control — Allows noise or unwanted information, such as tapehead switching and closed captioning, to be eliminated from the top, bottom, left, and right of the display.

Freeze control — Individual window images can be frozen (locked) to the current image or, using RS-232/RS-422 remote control, all window images can be frozen.

Factory patterns and user-defined window configurations — Twenty factory pattern preset window configurations (all available through the menu system or through RS-232/RS-422 commands) and 24 user-defined window configurations (8 available through the front panel buttons or all 24 available through RS-232/RS-422 commands) can be retrieved from memory.

Stereo audio switching — A 4 x 1 stereo audio switching system allows the audio input for any video input to be selected for audio output.

Executive mode — Locks out all front panel image adjustment functions and preset recalls except input selection. When executive mode is active, all image adjustments are available through RS-232/RS-422 commands.

Genlock — Allows for the seamless switching between video sources by using an external black burst signal to synchronize devices.

RS-232/RS-422 remote control — Allows third-party remote control of features and functions using Extron's Simple Instruction Set™(SIS™) or Extron's control software for Windows®.

Rack mountable — The 2U high, full rack width, metal enclosure is rack mountable.

Chapter Two

Installation

Rack Mounting Procedure

Rear Panel Connectors

Connecting the MVP 104GX

Setting Up Genlock and Vertical Interval Switching

If the MVP 104GX is to be rack mounted, follow the *Rack Mounting Procedure* below **before** proceeding any further. Otherwise, skip to *Rear Panel Connectors* and continue with the installation.

Rack Mounting Procedure

1. Before proceeding, verify that the MVP 104GX is not cabled to any devices or connected to any power source.
2. Position the MVP 104GX in the mounting rack so that the 4 slots in the mounting ears are aligned with the rack mounting holes. Use 4 large-headed mounting screws to attach the MVP 104GX to the rack.

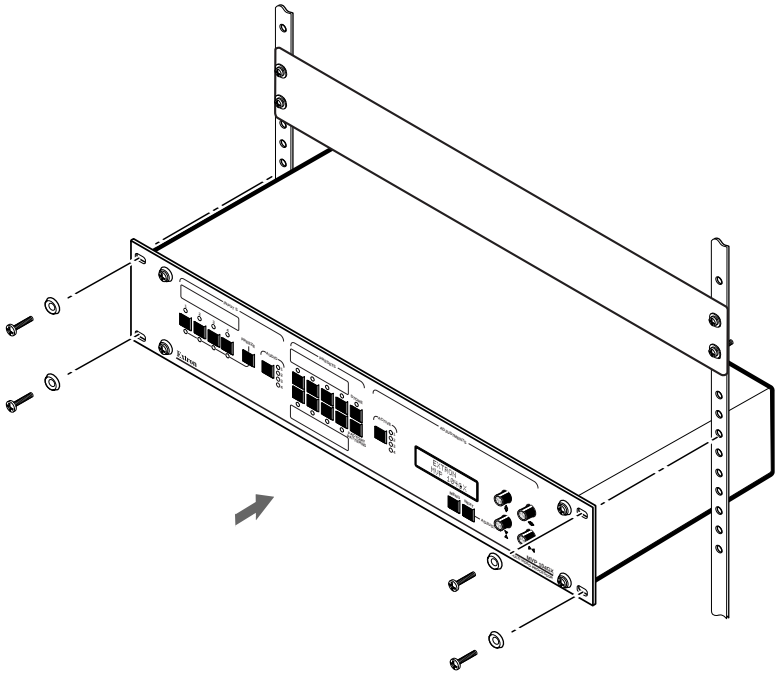


Figure 2-1 — Rack mounting the MVP 104GX

Rear Panel Connectors

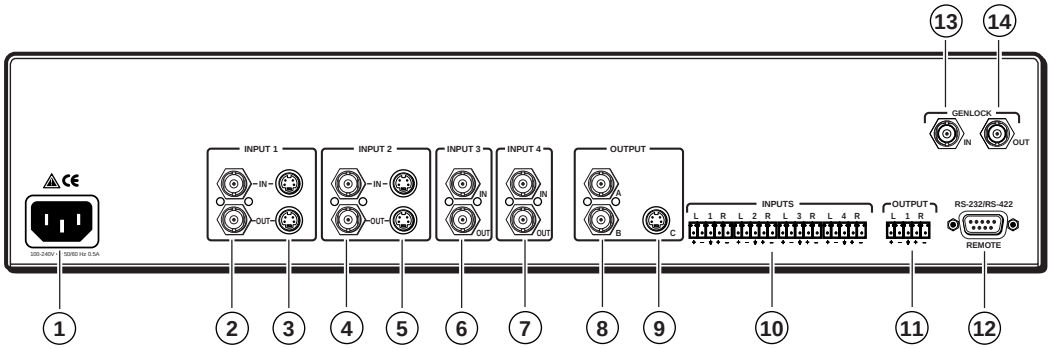


Figure 2-2 — Rear panel of MVP 104GX

1. **AC power —** Standard AC power connector for a power source of 100 – 240VAC, operating at 50/60 Hz.
2. **Input 1: composite video input and loopout —** One female BNC for composite video input, and one female BNC for buffered composite video loopout.
3. **Input 1: S-video input and loopout —** One female 4-pin mini-DIN for S-video input, and one female 4-pin mini-DIN for buffered S-video loopout.
4. **Input 2: composite video input and loopout —** One female BNC for composite video input, and one female BNC for buffered composite video loopout.
5. **Input 2: S-video input and loopout —** One female 4-pin mini-DIN for S-video input, and one female 4-pin mini-DIN for buffered S-video loopout.
6. **Input 3: composite video input and loopout —** One female BNC for composite video input, and one female BNC for buffered composite video loopout.
7. **Input 4: composite video input and loopout —** One female BNC for composite video input, and one female BNC for buffered composite video loopout.
8. **Composite video output —** Two female BNCs (A and B) for simultaneous output of composite video (and S-video).
9. **S-video output —** One female 4-pin mini-DIN connector for simultaneous output of S-video (and composite video).
10. **Audio inputs —** Four stereo audio balanced/unbalanced 3.5 mm, 5-pole, captive screw inputs. See *Audio input and output* in this chapter.
11. **Audio output —** One stereo audio balanced/unbalanced 3.5 mm, 5-pole, captive screw output. See *Audio input and output* in this chapter.
12. **RS-232/RS-422 remote —** One female 9-pin D connector for a host computer or third party controller using Extron's Simple Instruction Set™ (SIS™) or control software for Windows®.

NOTE *The MVP 104GX comes from the factory already configured for RS-232. To set the MVP 104GX for RS-422 operation, see "Configuring the MVP 104GX for RS-422" in the appendix.*

⑬ **Genlock input —** Connect an external black burst signal for genlocking the video signal in broadcast or other sync-critical applications.

⑭ **Genlock output —** Connect any downstream equipment that requires genlocking for broadcast or other sync-critical applications.

Connecting the MVP 104GX

The MVP 104GX can be connected to as many as four input devices simultaneously and output to as many as three devices simultaneously. Follow the steps below and see the installation example in *figure 2-3*.

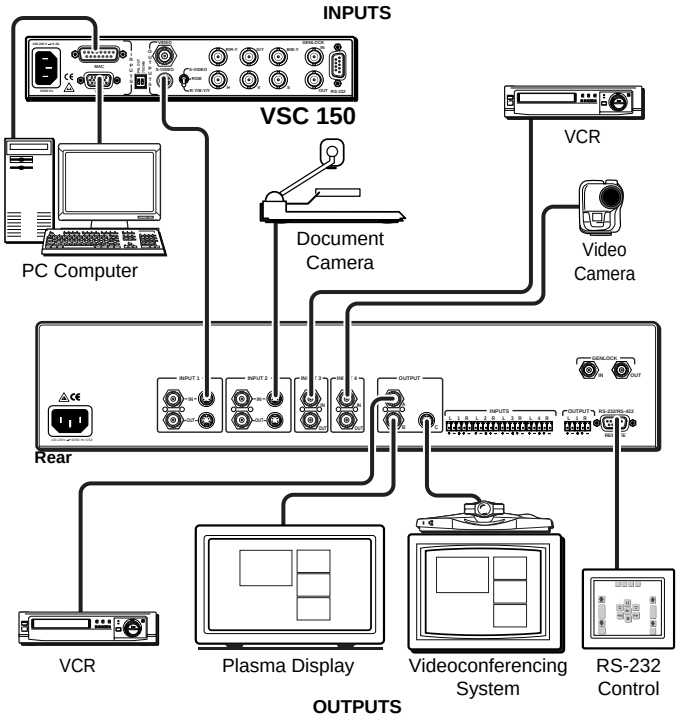


Figure 2-3 — MVP 104GX installation example

1. If the MVP 104GX is to be rack mounted, see the earlier *Rack Mounting Procedure*.
2. Turn off power to the MVP 104GX and all other devices that will be connected.
3. Using Inputs 1, 2, 3, and 4, attach up to four composite/S-video input devices to the MVP 104GX. Inputs 1 and 2 can be either composite video or S-video, inputs 3 and 4 are composite video only. The buffered loopout connectors for all inputs can be used to output the identical signal to other devices.

NOTE *Any inputs must be either* ***all*** *NTSC or* ***all*** *PAL, they cannot be both.*

4 Connect up to three output devices to the MVP 104GX using composite video output A, composite video output B, and S-video output C.

5 For stereo audio input, connect up to four audio sources to audio inputs 1, 2, 3, and 4. See the following *Audio input and output* section.

6 For stereo audio output, connect an audio output device to the 3.5 mm stereo audio output connector. See the following *Audio input and output* section.

7 If the MVP 104GX is to be connected to a computer or host controller for remote control, connect the host's RS-232/RS-422 cable to the 9-pin female RS-232/RS-422 remote connector of the MVP 104GX. For an RS-232/ RS-422 pinout table, see the *Remote Control Port (RS-232/RS-422)* section in chapter 5.

NOTE *The MVP 104GX comes from the factory already configured for RS-232. To set the MVP 104GX for RS-422 operation, see "Configuring the MVP 104GX for RS-422" in the appendix.*

8 Power up the input and output devices, then connect power to the MVP 104GX.

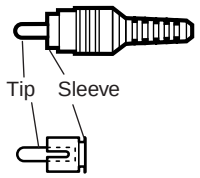
Audio input and output

Before connecting audio, determine whether your audio system is unbalanced or balanced. Then, follow the instructions and illustrations below to connect either unbalanced audio or balanced audio.

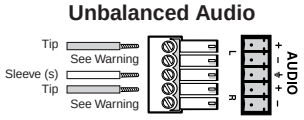
WARNING *Wiring the audio incorrectly can damage the audio output circuits.*

Unbalanced audio

1. Attach the audio cable to an unbalanced powered speaker input connector (tip and sleeve), as shown here.



2. Attach the other end of the audio cable to the audio cable connector (Extron part number 10-319-10). Fasten the captive screws inside the audio cable connector as shown in *figure 2-4*.

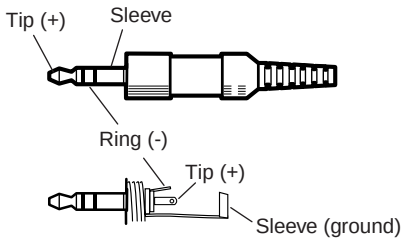


WARNING *Connect the sleeve(s) to ground (GND). Connecting the sleeve(s) to a negative (-) terminal will damage audio output circuits.*

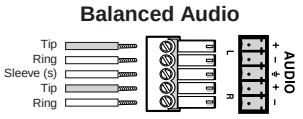
3. Slide the audio cable connector into the audio connector of the MVP 104GX, and plug the speaker end of the audio cable into the speakers.

Balanced audio

1. Attach the audio cable to a balanced speaker input connector (tip, ring, and sleeve), as shown here.



2. Attach the other end of the audio cable to the audio cable connector (Extron part number 10-319-10). Fasten the captive screws inside the audio cable connector as shown in *figure 2-4*.



WARNING *Connect the sleeve(s) to ground (GND). Connecting the sleeve(s) to a negative (-) terminal will damage audio output circuits.*

3. Slide the audio cable connector into the audio connector of the MVP 104GX, and plug the speaker end of the audio cable into the speakers.

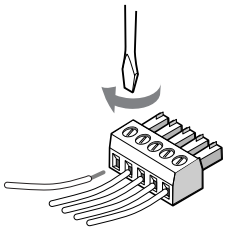


Figure 2-4 — Fastening captive screws

Genlock connections

A genlock (black burst generator) device can be connected to the MVP 104GX via the BNC connectors shown below. The genlock feature allows the MVP 104GX to be synchronized with other system components for seamless vertical interval switching between sources. See *Setting Up Genlock and Vertical Interval Switching* in this chapter.

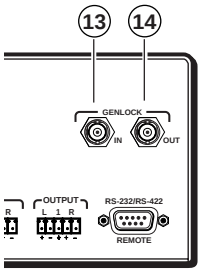


Figure 2-5 —Genlock connections

13 **Genlock input connector** — Connect an external black burst signal to this BNC connection for genlocking the video signal in broadcast or other sync-critical applications.

14 **Genlock output connector** — Connect any downstream equipment that requires genlocking to this BNC connector to route the black burst signal throughout the system in broadcast or other sync-critical applications.

Setting Up Genlock and Vertical Interval Switching

For vertical interval switching (to allow clean switching between signals from several devices during the vertical blanking period of each signal), a composite sync signal can be applied at the Genlock In connector, and also passed to another device via the Genlock Out connector.

If the genlock connectors are used only for vertical interval switching, no horizontal or subcarrier phase adjustments are required.

Genlock setup

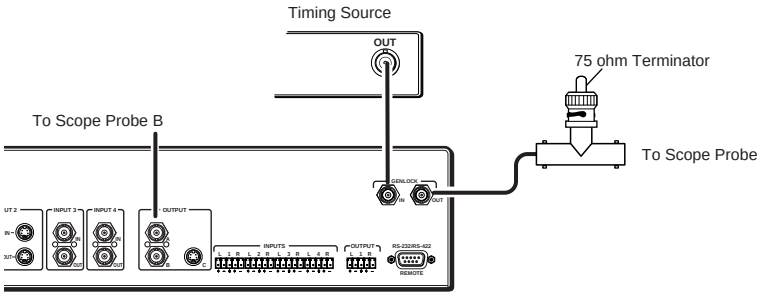
Genlock differs from simple vertical interval switching in that an external device (a black burst generator) generates a reference sync signal for the system, and every device that uses that signal has its output signal's horizontal and subcarrier phases adjusted to exactly match that of the generator to allow precise timing and full synchronization. Genlocked systems produce cleaner switches between inputs than do those without this type of synchronization.

An oscilloscope is required for genlock setup, and a vectorscope is recommended. Waveform monitors of types other than a vectorscope may give the appearance that timing is adjusted correctly when it is 180 degrees out of phase, which will result in incorrect colors or picture artifacts.

NOTE *All equipment in the system must be powered up and turned on for at least 15 to 20 minutes before genlock setup adjustments can be made and before the equipment is used in a genlocked application.*

To synchronize the MVP 104GX's video output with a genlock signal, follow these steps:

1. Power up and turn on all the devices that will use the genlock signal. The devices must be on for at least 15 to 20 minutes before proceeding with any adjustments.
2. Connect the active timing source signal to the Genlock In connector on the rear panel.



3. Connect the video input signals to the MVP 104GX, as described previously in this chapter.
4. Connect the oscilloscope ("scope") probe A to the Genlock Out connector. This will provide the scope's reference signal. In order to avoid altering the genlock signal, use the cabling configuration that will be used in the installation. Either connect the genlock signal cable from the scope to the next device in the system to be timed, or provide 75 ohm termination at the scope's genlock output.
5. Connect scope probe B to the MVP 104GX's composite video output connector.
6. Using the instructions for the scope you are using, set the scope to view the signals' horizontal phases. Adjust the horizontal phase until there is no (0°) difference between the composite video output's horizontal sync phase and the genlock signal's horizontal phase. See *Oscilloscope displays*.
7. Set the scope to view the subcarrier signals. Adjust the sub phase by rotating the encoder knob until there is a zero phase difference between the genlock signal and the NTSC/PAL output.
8. View the horizontal phases again. If the phase difference is not zero, repeat steps 6 and 7 until the settings do not change.
9. Once the settings are stable, disconnect the oscilloscope, and reconnect the genlock cables.
10. Check the display(s) for proper colors and for undesirable artifacts in the image(s). Make adjustments as necessary.
11. If other MVP 104GXs are part of this genlock daisy chain, connect the oscilloscope to each device, and repeat this procedure.

Oscilloscope displays

What you see on the oscilloscope while adjusting the MVP 104GX to match the genlock signal depends on the type of signal used, the type of oscilloscope, and the procedure the scope requires. This section shows some examples of oscilloscope displays.

Figure 2-6 below shows the genlock input signal (top) and an out-of-alignment NTSC composite sync output signal (bottom) displayed on a waveform monitor to check for alignment. When the phases are aligned, the wave peaks on the bottom waveform should line up with those in the reference signal above it.

With this method there is no way to know if the signals are 180º out of phase. A delayed sweep on a time-based scope would allow a more accurate display of the input and output signal phase relationships.

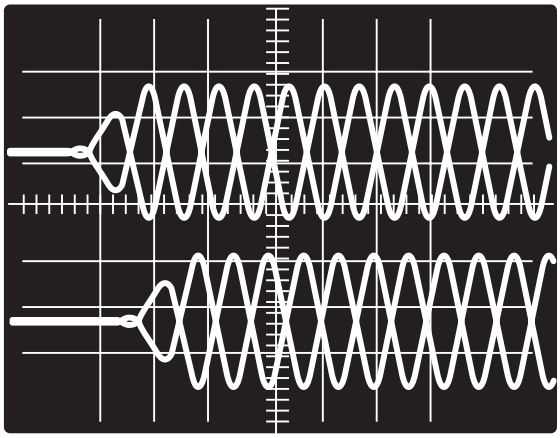


Figure 2-6 — Superimposed waveforms

A vectorscope is more accurate than a waveform monitor. *Figure 2-7* shows an example of a vectorscope display when the horizontal phase is adjusted to align it with the burst (genlock) vector. Adjust the horizontal phase by rotating the encoder knob until the difference between the two vectors is 0º. This example shows black burst only (with no color). The burst vector is pointing to the left from the center.

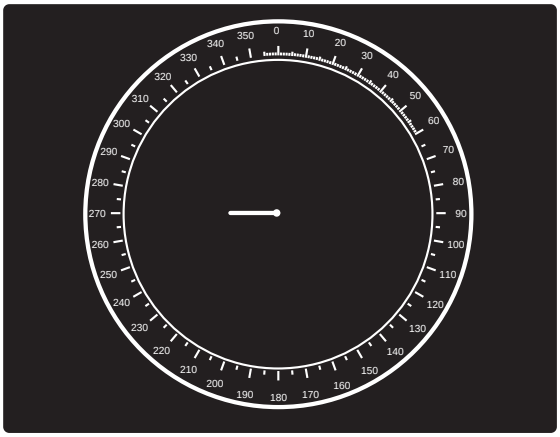


Figure 2-7 — Vectorscope screen during horizontal phase adjustment

Figure 2-8 below shows an example of a view of a vectorscope during adjustment of the color subcarrier phase (SC/H). The subcarrier phase should be aligned to 0º (indicated in the figure by the triangle).

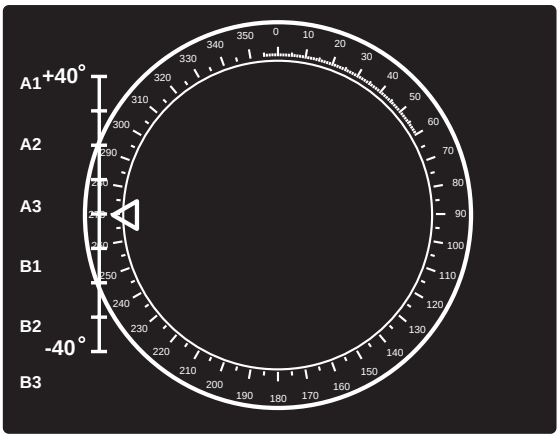


Figure 2-8 — Vectorscope screen during color subcarrier phase adjustment

Chapter Three

Operation

Front Panel Features

Menu Flowchart

Front Panel Operation

Optimizing the Image

Using the Menu System

Front Panel Features

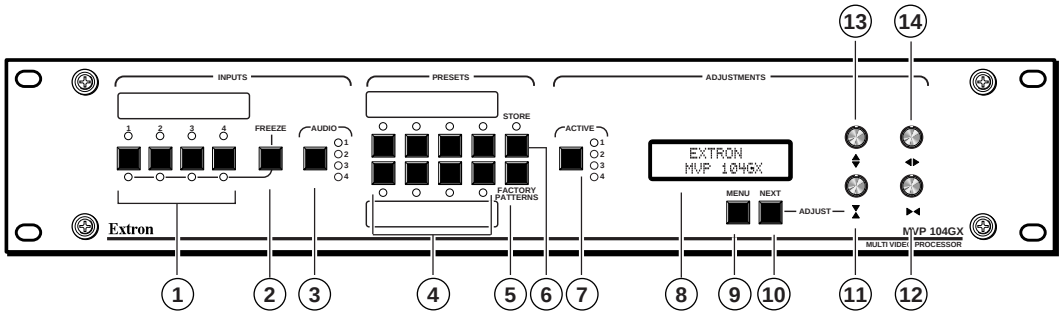


Figure 3-1 — Front panel details of the MVP 104GX

(1) **Input selection —** The four input buttons turn on and turn off the input window images to the output. The green LED above each button lights whenever the input image is selected.

(2) **Freeze control —** Holding down this button and then pressing an input window selection button (described in (1) above) freezes the selected input image window. The red LED below each input window selection button lights whenever the input image is frozen.

(3) **Audio input selection —** Pressing this button successively 4 times cycles through all four audio inputs and switches audio to audio output. The green LED for each audio input lights as it is selected. Selecting past audio input 4 turns off the audio output and does not light any LED.

(4) **User presets —** The 8 buttons recalls 8 preset user-defined window output configurations including window positioning, sizing, blanking, priority, and audio input selection. The amber LED above/below each preset button lights whenever the button has been selected. The 8 previously mentioned user presets, available through the 8 front panel buttons, and an additional 16 user presets (available only through RS-232/RS-422 commands), are all available through RS-232/RS-422 commands.

(5) **Factory patterns —** Pressing this button and rotating the **Vertical sizing** knob recalls 20 factory pattern preset window output configurations.

(6) **Store preset —** After a window output configuration has been set up correctly, pressing this button for 2 seconds lights its green LED. At this point, pressing any of the 8 user preset buttons (described in (4) above) will store that particular window output configuration to the selected user preset button.

(7) **Active window selection —** Pressing this button successively cycles through all enabled input windows only (indicated by the lit input LED(s)). The **Active window selection** button's green LED lights when selected **and** when the corresponding input is also enabled. The selected window, which has a green border, can then be configured. Cycling past the fourth window deselects all windows on the output display.

(8) **LCD menu display —** A 16 x 2 LCD for displaying window configuration and information menus.

(9) **Menu —** This button is used to advance to the next menu group. See the *Menu Flowchart* section which follows.

(10) **Next —** This button is used to step through the submenus or to return to the beginning of the menu group. See the *Menu Flowchart* section which follows.

⑪ **Vertical sizing —** While the menu system's LCD display is in the default mode (see the *Menu Flowchart* section) and a window is active, rotating this adjustment knob increases or decreases the vertical sizing of the window image. This knob is also used to adjust other functions.

⑫ **Horizontal sizing —** While the menu system's LCD display is in the default mode (see the *Menu Flowchart* section) and a window is active, rotating this adjustment knob increases or decreases the horizontal sizing of the window image. This knob is also used to adjust other functions.

⑬ **Vertical positioning —** While the menu system's LCD display is in the default mode (see the *Menu Flowchart* section) and a window is active, rotating this adjustment knob shifts the window image up or down.

⑭ **Horizontal positioning —** While the menu system's LCD display is in the default mode (see the *Menu Flowchart* section) and a window is active, rotating this adjustment knob shifts the window image left or right.

Menu Flowchart

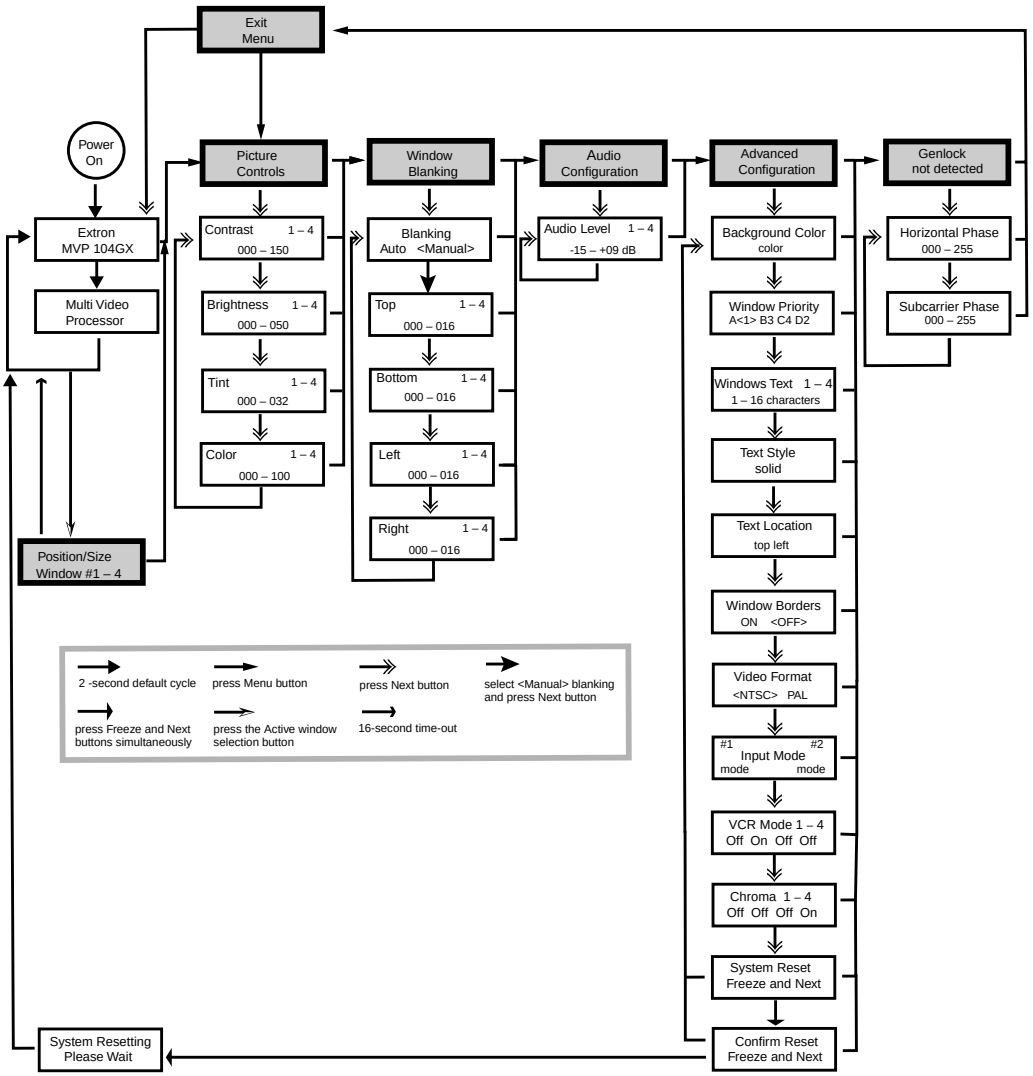


Figure 3-2 — Flowchart of menus (shaded boxes) and submenus

Front Panel Operation

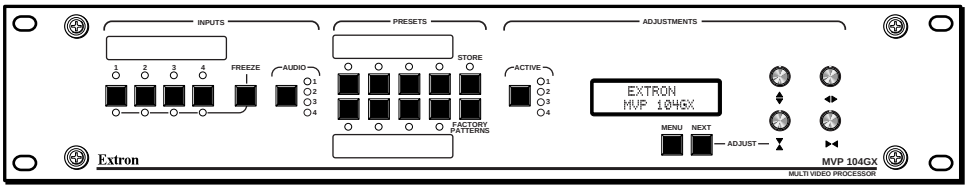
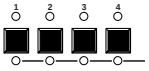


Figure 3-3 — MVP 104GX front panel

The functions of the front panel controls are described in the following sections.

Input selection

The four numbered **Input selection** buttons (1 – 4) will select from among the 4 separate input sources:



Input 1: selects either a composite video or S-video input

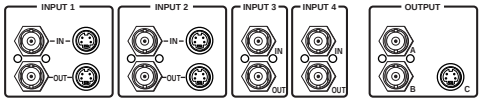
Input 2: selects either a composite video or S-video input

Input 3: selects a composite video input

Input 4: selects a composite video input

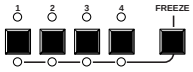
The **Input** buttons correspond to the numbered input connectors on the rear panel. After you select an **Input selection** button, the green LED indicator above the button lights. Selecting an input selects the input image to output to a window. To deselect an **Input** button, press that button again.

The MVP 104GX can output all selected input images to the single S-video output and the two composite video outputs simultaneously.



Freeze control

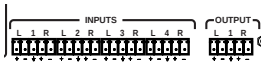
Pressing the **Freeze** control button while pressing an **Input selection** button freezes the selected input image window. The red LED below each **Input selection** button lights whenever the input image is frozen. To unfreeze the individual input windows, repeat this process for each frozen input image window.



NOTE *The only way to freeze or unfreeze all input window images in one operation is through an RS-232/RS-422 command. See the "Programmer's Guide" chapter.*

Audio input selection

Pressing the **Audio input selection** button successive times cycles through all four audio inputs and switches the audio input to audio output. The green LED for each audio input lights as it is selected. Selecting past audio input 4 turns off all audio output and does not light any LED.



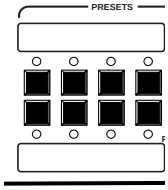
NOTE *Selecting past audio input 4 switches audio to audio input 0 (no audio is selected). The audio can also be deselected through an RS-232/RS-422 command and using 0 as the audio input number. See the "Programmer's Guide" chapter.*

User presets

NOTE *Before storing any presets, first optimize the window images by setting the picture controls (contrast, brightness, tint, color), the sizing and positioning (horizontal and vertical), and the blanking (top, bottom, left, right). See the "Optimizing the Image" section.*

The eight user **Preset** buttons save/recall eight preset user-defined window output configurations, including window positioning, sizing, blanking, priority, test, and audio input selection.

- To save the current window configuration, while in the Default Cycle menu (see *Default cycle menu* section), press the **Store** button for three seconds. The green LED above the store button lights and the amber LED above or below each **Preset** button flashes for 16 seconds. The message "Select Location To Save" also appears on the LCD panel during those 16 seconds. During this time, press a **Preset** button to save the configuration. The amber LED above or below the selected user preset button lights and the message "User Preset Saved" appears on the LCD panel for 16 seconds. Wait until the Default Cycle menu resumes before pressing any other button.



Select Location To Save

User Preset Saved

User Preset Recalled

- To recall a user preset, while in the Default Cycle menu, select a user preset button. The preset's LED lights amber. Any configuration modification made to a selected user preset turns the LED off.
- Above and below the **Preset** buttons are slots to attach labels which identifies the preset configurations. The 8 user presets can also be saved/recalled through RS-232/RS-422 commands. In addition to these 8 user presets, 16 more user presets can be saved/recalled through RS-232/RS-422 commands only. See the *Programmer's Guide* chapter.

Factory patterns

While the LCD panel is in the Default Cycle menu (see *Default cycle menu* section), pressing the **Factory Patterns** button displays the LCD message "Preset ## of 20 Menu= No Next=Yes" where ## refers to the factory pattern preset from 01 to 20. Rotating the **Vertical sizing** knob recalls the 20 factory pattern preset window output configurations. Pressing the **Menu** button rejects the configuration (=No), and pressing the **Next** button accepts the configuration (=Yes). Any factory pattern preset can be conveniently stored as a user preset (see the previous *User presets* section).

Preset ## of 20
Menu=No Next= Yes

See *figure 3-4* for an illustration of the 20 factory pattern presets.

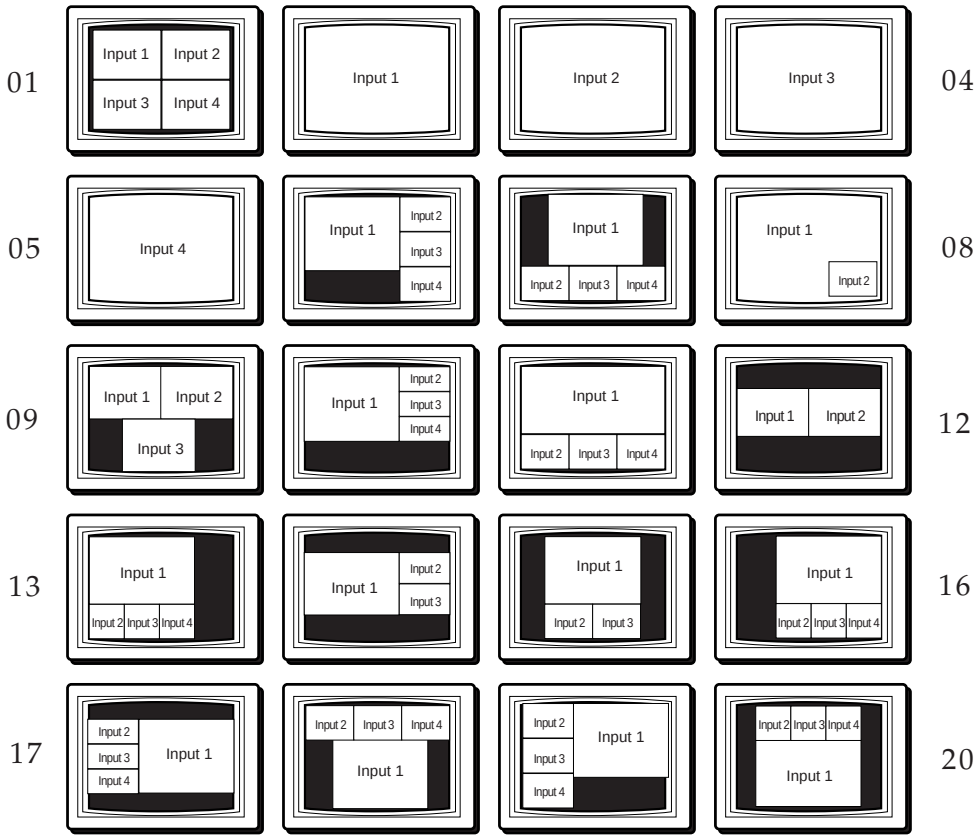


Figure 3-4 — MVP 104GX factory preset window patterns

Active window selection

Press the **Active** window selection button repeatedly to cycle through all active input windows (the green LED lights). An active window is available only if its corresponding **Input** selection button has been previously selected (indicated by the **Input** selection button's green LED being lit). The selected window, which has a green border, can then be configured. Cycling past the fourth window turns off all LEDs, and all windows are deselected. If the selected window has been modified, the window is deselected after 5 seconds, and the LED turns off.

Menu and Next buttons with the LCD panel

Press the **Menu** button to access the menu system. Press the **Next** button to step through the submenus. The LCD panel

displays the selected menus and submenus. See the sections *Menu Flowchart* and *Using the Menu System*.

Horizontal sizing

While the MVP 104GX is in the Default Cycle menu (see the *Default Cycle menu* section), selecting an active input window and rotating the **Horizontal sizing** knob sizes the selected window image horizontally. See the *Position/Size window menu* section.

Vertical sizing

While the MVP 104GX is in the Default Cycle menu (see the *Default Cycle menu* section), selecting an active input window and rotating the **Vertical sizing** knob sizes the selected window image vertically. See the *Position/Size window menu* section.

Horizontal positioning

While the MVP 104GX is in the Default Cycle menu (see the *Default Cycle menu* section), selecting an active input window and rotating the **Horizontal positioning** knob positions the selected window image horizontally. See the *Position/Size window menu* section.

Vertical positioning

While the MVP 104GX is in the Default Cycle menu (see the *Default Cycle menu* section), selecting an active input window and rotating the **Vertical positioning** knob positions the selected window image vertically. See the *Position/Size window menu* section.

Optimizing the Image

Before storing any user presets, adjust the input window images for optimum contrast, brightness, tint, color, positioning, sizing, and blanking. Upon initial power up of the MVP 104GX, factory pattern #01 in *figure 3-4* is the default windows preset. Using this preset, all four input windows can be optimized, as shown in the following steps. See the flowchart in the *Menu Flowchart* section, and see the *Using the Menu System* section for further details.

1. From the Default Cycle menu, press the **Menu** button to advance to the Picture Controls menu. Press the **Next** button to select the submenus, and press the **Active window selection** button to select a window.

   a. **Contrast —** Rotate the **Vertical sizing** knob to increase or decrease the window contrast from 0 to 150 (default is 141).

   b. **Brightness —** Rotate the **Vertical sizing** knob to increase or decrease the window brightness from 0 to 50 (default is 23).

   c. **Tint —** Rotate the **Vertical sizing** knob to increase or decrease the window tint from 0 to 32 (default is 16).

   d. **Color —** Rotate the **Vertical sizing** knob to increase or decrease the window color from 0 to 100 (default is 80).

2. Press the **Menu** button to advance to the Default Cycle menu, then press the **Active window selection** button to select a window to position or size.

   a. **Horizontal positioning —** Rotate the **Horizontal positioning** knob to move the left side of the selected window to a desired location, keeping

in mind that sizing the window horizontally moves the right side of the window only.

b. **Horizontal sizing —** Rotate the **Horizontal sizing** knob to adjust the right side of the window.

c. **Vertical positioning —** Rotate the **Vertical positioning** knob to move the top side of the selected window to a desired location, keeping in mind that sizing the window vertically moves the bottom side of the window only.

d. **Vertical sizing —** Rotate the **Vertical sizing** knob to adjust the bottom side of the window.

3. Press the **Menu** button to advance to the Window blanking menu. Press the **Next** button to advance to the Blanking submenu. Using the **Vertical sizing** knob, select <Manual>. Press the **Next** button to select the submenus, and press the **Active window selection** button to select a window. The following submenus remove unwanted information or noise from the top, bottom, left, and right edges of a displayed image.

   a. **Top blanking —** Rotate the **Vertical sizing** knob to increase or decrease the top blanking from 0 to 16.

   b. **Bottom blanking —** Rotate the **Vertical sizing** knob to increase or decrease the bottom blanking from 0 to 16.

   c. **Left blanking —** Rotate the **Vertical sizing** knob to increase or decrease the left blanking from 0 to 16.

   d. **Right blanking —** Rotate the **Vertical sizing** knob to increase or decrease the right blanking from 0 to 16.

4. If any of the windows requires further positioning/sizing, repeat steps 2 and 3.

5. After optimizing the window image(s), save the configuration, as follows: Press the **Store** button for 2 seconds. After the **Store** button LED lights green and all eight **User preset** button LEDs flash amber, select a **User preset** button to store the saved configuration. See the *User presets* section for a detailed explanation.

Using the Menu System

The MVP 104GX menu system is accessed through the **Menu** and **Next** buttons while viewing the LCD panel display. See the previous *Menu Flowchart* section as a helpful guide while navigating the menu system. Use the chart below to reference the various flowchart arrows.

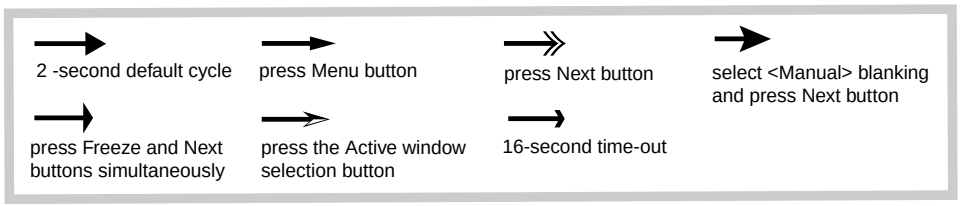
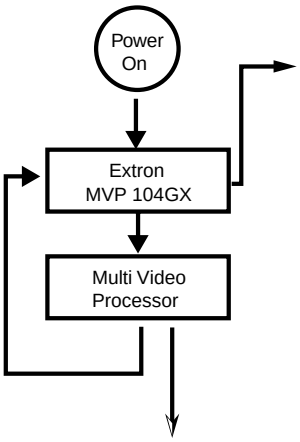


Figure 3-5 — MVP 104GX flowchart arrow designations

Default Cycle menu

After the initial power on of the MVP 104GX, the LCD displays a default cycle of two informational submenus, with each submenu appearing in 2-second intervals. Each submenu is for information only and displays the product name and the product type. While in this cycle, any user-enabled **Input** selection button LEDs light green.



Product Name submenu

This submenu identifies the product name as the MVP 104GX. Press the **Menu** button to exit the Default Cycle menu and advance to the Picture Controls menu.

To adjust any active window's sizing or positioning, press the appropriate **Active window selection** button.

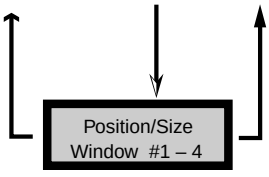
Product Type submenu

This submenu describes the product type as a multi video processor. Press the **Menu** button to exit the Default Cycle menu and advance to the Picture Controls menu.

To adjust any active window's sizing or positioning, press the appropriate **Active window selection** button.

Position/Size Window menu

While the MVP 104GX is in the Default Cycle menu, pressing the **Active window selection** button selects the Position/Size Window menu for the chosen window (#1, 2, 3, 4, or none). The active window can be sized and positioned either horizontally or vertically by viewing the active window and adjusting the appropriate knob, as indicated by the following illustrations.

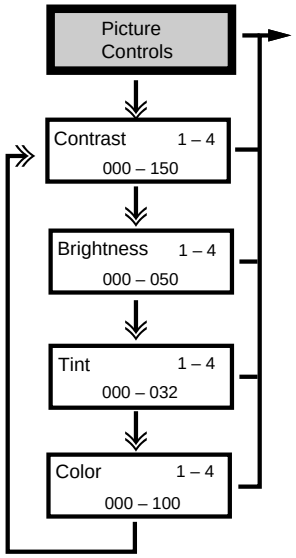


Vertical sizing: **Horizontal sizing**:

Vertical positioning: **Horizontal positioning**:

Press the **Menu** button to advance to the Picture Controls menu, or return to the Default Cycle menu by allowing the 16-second time-out to occur.

Picture Controls menu



The Picture Controls menu adjusts the contrast, brightness, tint, and color of a selected window image by rotating the **Vertical sizing** knob. The picture control settings are displayed on the bottom of the LCD panel. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Contrast submenu, or press the **Menu** button to exit the Picture Controls menu and advance to the Window Blanking menu. A 16-second time-out returns you to the Default Cycle menu if no button is pressed from either this menu or the following submenus.

Contrast submenu

Increase or decrease the picture contrast from 0 to 150 by rotating the **Vertical sizing** knob . The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Brightness submenu, or press the **Menu** button to exit the Contrast submenu and advance to the Window Blanking menu.

Brightness submenu

Increase or decrease the picture brightness from 0 to 50 by rotating the **Vertical sizing** knob. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Tint submenu, or press the **Menu** button to exit the Brightness submenu and advance to the Window Blanking menu.

Tint submenu

Increase or decrease the picture tint from 0 to 32 by rotating the **Vertical sizing** knob. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Color submenu, or press the **Menu** button to exit the Tint submenu and advance to the Window Blanking menu.

Color submenu

Increase or decrease the picture color from 0 to 100 by rotating the **Vertical sizing** knob. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right

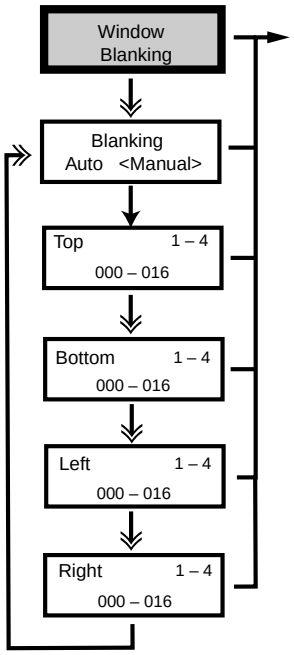
corner of the LCD panel. Press the **Next** button to return to the Picture Controls menu, or press the **Menu** button to exit the Color submenu and advance to the Window Blanking menu.

Window Blanking menu

Remove unwanted information/noise from the edges of each displayed image by adjusting the blanking. After selecting a window by pressing the **Active window selection** button (1, 2, 3, or 4), the Window Blanking menu adjusts the top, bottom, left, and right blanking of each output window by rotating the **Vertical sizing** knob. The selected window number is displayed in the upper right corner of the LCD panel. The window blanking setting is displayed on the bottom of the LCD panel. Press the **Next** button to advance to the Blanking submenu, or press the **Menu** button to exit the Window Blanking menu and advance to the Audio Configuration menu.

Blanking submenu

Rotate the **Vertical sizing** knob to select <Manual> blanking and press the **Next** button to advance to the Top submenu, or press the **Menu** button to exit the Blanking submenu and advance to the Audio Configuration menu.



Top submenu

Increase or decrease the Top blanking from 0 to 16 by rotating the **Vertical sizing** knob until the unwanted information no longer appears. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Bottom submenu, or press the **Menu** button to exit the Top submenu and advance to the Audio Configuration menu.

Bottom submenu

Increase or decrease the Bottom blanking from 0 to 16 by rotating the **Vertical sizing** knob until the unwanted information no longer appears. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Left submenu, or press the **Menu** button to exit the Bottom submenu and advance to the Audio Configuration menu.

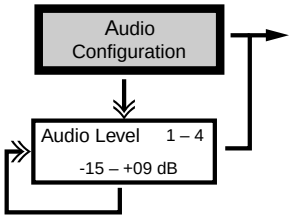
Left submenu

Increase or decrease the Left blanking from 0 to 16 by rotating the **Vertical sizing** knob until the unwanted information no longer appears. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to advance to the Right submenu, or press the **Menu** button to exit the Left submenu and advance to the Audio Configuration menu.

Right submenu

Increase or decrease the Right blanking from 0 to 16 by rotating the **Vertical sizing** knob until the unwanted information no longer appears. The selected window number (1, 2, 3, or 4), designated by pressing the **Active window selection** button, is displayed in the upper right corner of the LCD panel. Press the **Next** button to return to the Window Blanking menu, or press the **Menu** button to exit the Right submenu and advance to the Audio Configuration menu.

Audio Configuration menu



The Audio Configuration menu consists of an Audio Level submenu which adjusts the audio level of an input. Press the **Next** button to advance to the Audio Level submenu, or press the **Menu** button to exit the Audio Configuration menu and proceed to the Advanced Configuration menu. A 16-second time-out returns you to the Default Cycle menu if no button is pressed from either this menu or the following submenu.

Audio Level submenu

After selecting a window by pressing the **Active window selection** button (1, 2, 3, or 4), increase or decrease the window's audio level from -15 to +9 dB by rotating the **Vertical sizing** knob. The audio configuration setting is displayed on the bottom of the LCD panel. The selected window number is displayed in the upper right corner of the LCD panel. Press the **Next** button to return to the Audio Configuration menu, or press the **Menu** button to exit the Audio Level submenu and proceed to the Advanced Configuration menu.

Advanced Configuration menu

In the Advanced Configuration menu, adjust the background color, window priority, window text, window borders, and video format of the window image by rotating the **Vertical sizing** knob (see note below). The advanced configuration settings are displayed on the bottom of the LCD panel.

NOTE *Rotating the **Horizontal sizing** knob while in the Window Text submenu shifts to each character position.*

System Reset and Confirm Reset can also be accessed from this menu. Press the **Next** button to advance to the Background Color submenu, or press the **Menu** button to exit the Advanced Configuration menu and proceed to the Genlock menu. A 16-second time-out returns you to the Default Cycle menu if no button is pressed from either this menu or the following submenus.

Background Color submenu

Change the window background color by rotating the **Vertical sizing** knob. The eight background colors are: *white*, *yellow*, *cyan*, *green*, *magenta*, *red*, *blue*, and *black*.

Press the **Next** button to advance to the Window Priority submenu, or press the **Menu** button to exit the Background Color submenu and proceed to the Genlock menu.

Window Priority submenu

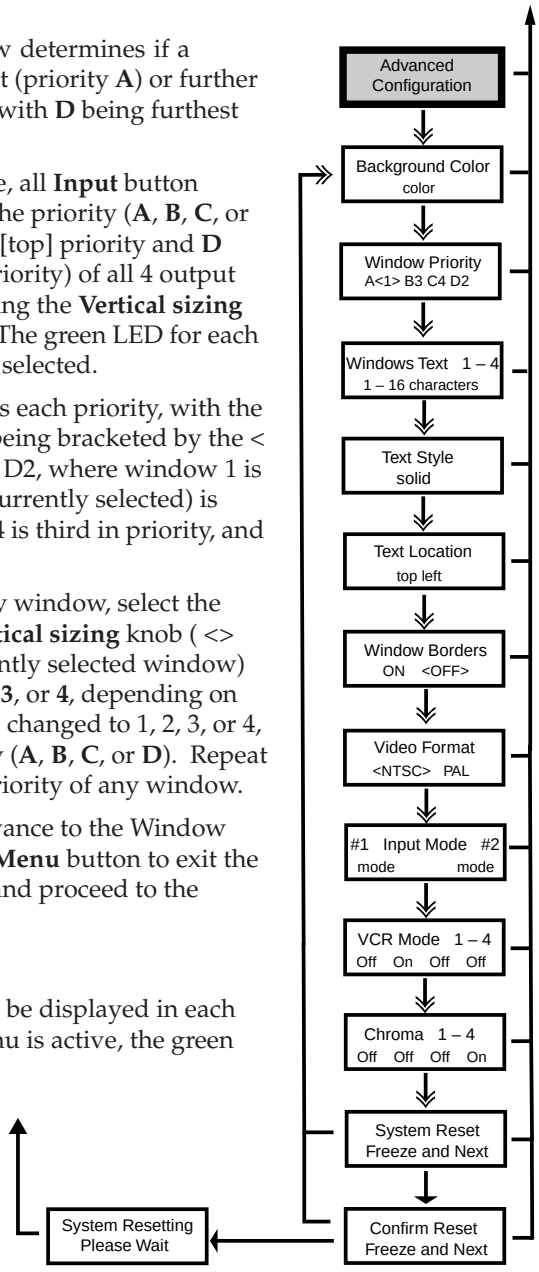
The priority of each window determines if a window is displayed in front (priority **A**) or further back (priorities **B**, **C** and **D**, with **D** being furthest back).

While this submenu is active, all **Input** button LEDs blink green. Change the priority (**A**, **B**, **C**, or **D,** with **A** being the highest [top] priority and **D** being the lowest [bottom] priority) of all 4 output windows (1, 2, 3, 4) by rotating the **Vertical sizing** knob to select the window. The green LED for each active window lights as it is selected.

The window number follows each priority, with the currently selected window being bracketed by the < > symbols, e.g. A1 B <3> C4 D2, where window 1 is first in priority, window 3 (currently selected) is second in priority, window 4 is third in priority, and window 2 is last in priority.

To change the priority of any window, select the window by rotating the **Vertical sizing** knob (<> brackets designate the currently selected window) and press **Input** button **1**, **2**, **3**, or **4**, depending on whether the window will be changed to 1, 2, 3, or 4, respectively, for that priority (**A**, **B**, **C**, or **D**). Repeat this process to change the priority of any window.

Press the **Next** button to advance to the Window Text submenu, or press the **Menu** button to exit the Window Priority submenu and proceed to the Genlock menu.



Window Text submenu

This submenu allows text to be displayed in each window. While this submenu is active, the green LED for the Store button will continually blink. After selecting a window by pressing the **Active window selection** button (1, 2, 3, or 4), change the window text by rotating the **Horizontal sizing** knob to select the character position (up to 16 characters long), then rotate the **Vertical sizing** knob to change the character. Fifty-nine alphanumeric characters including a *space* are available:

ABCDEFGHIJKLMNOPQRSTUVWXYZ
space !"#$%&'()*+,-./0123456789:;<=>?@

Pressing the Store button deletes the currently selected text character. Press the **Next** button to advance to the Text Style submenu, or press the **Menu** button to exit the Window Text submenu and proceed to the Genlock menu.

Text Style submenu

Specify the text style for all output windows as either *solid* or *translucent* by rotating the **Vertical sizing** knob. Press the **Next** button to advance to the Text Location submenu, or press the **Menu** button to exit the Text Style submenu and proceed to the Genlock menu.

Text Location submenu

Specify the text location for all output windows by rotating the **Vertical sizing** knob and selecting *top left*, *top center*, *top right*, *bottom left*, *bottom center,* or *bottom right*. Press the **Next** button to advance to the Window Borders submenu, or press the **Menu** button to exit the Text Location submenu and proceed to the Genlock menu.

Window Borders submenu

Specify blue borders for all output windows by rotating the **Vertical sizing** knob and selecting either On or Off (the <> symbols designate the selection). Press the **Next** button to advance to the Video Format submenu, or press the **Menu** button to exit the Window Borders submenu and proceed to the Genlock menu.

Video Format submenu

Specify the video output format by rotating the **Vertical sizing** knob and selecting either NTSC or PAL (the <> symbols designate the selection). Press the **Next** button to advance to the Input Mode submenu, or press the **Menu** button to exit the Video Format submenu and proceed to the Genlock menu.

Input Mode submenu

In this submenu, the green LEDs for **Input** buttons 1 and 2 blink continually. Specify the input mode of Inputs 1 or 2 as either *auto, video,* or *S-video*, by repeatedly pressing **Input** buttons 1 or 2, respectively. *Auto* allows automatic detection and selection of the highest quality video input type first. Press the **Next** button to advance to the System Reset submenu, or press the **Menu** button to exit the Input Mode submenu and proceed to the Genlock menu.

VCR Mode submenu

Horizontal noise in an input's image can be eliminated by toggling the **Input** button On (default is all inputs Off) from this submenu. Press the **Next** button to advance to the Chroma submenu, or press the **Menu** button to exit the VCR Mode submenu and proceed to the Genlock menu.

Chroma submenu

To enable color output, toggle the **Input** button On (default is all inputs On) from this submenu. By toggling the button Off, the color is disabled and the output is black and white. Press the **Next** button to advance to the System Reset submenu, or press the **Menu** button to exit the Chroma submenu and proceed to the Genlock menu.

System Reset submenu

Reset the menu system by first holding down the **Freeze** button, then press the **Next** button (the system advances to the Confirm Reset submenu), or press the **Next** button to return to the Background Color submenu, or press the **Menu** button to exit the System Reset submenu and proceed to the Genlock menu.

Confirm Reset submenu

Confirm the menu system reset by first holding down the **Freeze** button, then press the **Next** button (the system advances to the System Resetting Please Wait submenu), or press the **Next** button to return to the Background Color submenu, or press the **Menu** button to exit the Confirm Reset submenu and proceed to the Genlock menu.

System Resetting Please Wait submenu

After 2 seconds, the menu system defaults to the Default Cycle menu.

Genlock menu

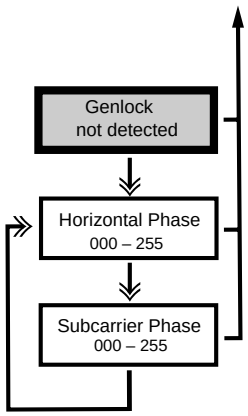
Press the **Menu** button to advance to the Exit menu, or press the **Next** button to proceed to the Horizontal Phase submenu.

Horizontal Phase submenu

The horizontal phase can be adjusted from 0 to 255 by rotating the **Vertical sizing** knob and observing the output display (the default is 128), or press the **Next** button to proceed to the Subcarrier Phase submenu, or press the **Menu** button to exit the horizontal phase and proceed to the Exit menu.

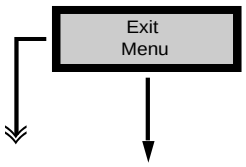
Subcarrier Phase submenu

The subcarrier phase can be adjusted from 0 to 255 by rotating the **Vertical sizing** knob and observing the output display (the default is 128), or press the **Next** button to return to the Horizontal Phase submenu, or press the **Menu** button to exit the Subcarrier Phase submenu and proceed to the Exit menu.



Exit menu

Press the **Next** button to return to the Default Cycle menu, or press the **Menu** button to return to the Picture Controls menu.



Chapter Four

Windows®-based Control Program

Installing Windows-based Control Software

Using the Software

The *MVP and SVS Control Program* (Extron part number 29-047-01), which is used by the MVP 104GX, requires Windows 95/98, NT, or later. It provides remote control of MVP 104GX functions.

Installing the Windows®-based Control Software

The program is contained on two 3.5-inch diskettes. The program occupies approximately 1.5 MB (megabytes) of hard-drive space. Run the program from the hard drive.

To install the software from the floppy disks onto the hard drive, run SETUP.EXE from the first floppy disk, and follow the instructions that appear on the screen.

By default, the Windows installation creates a C:\MVP+SVS directory, and it places two icons (MVP+SVS Control Pgm and MVP+SVS Help) into a group folder named "Extron Electronics".

Using the Software

1. To run the MVP and SVS Control Program, double-click on the MVP+SVS Control Pgm icon in the Extron Electronics group or folder.

   MVP+SVS Control Pgm

   The Comm menu appears on the screen.

2. Click on the comm port that is connected to the MVP 104GX RS-232 port.

   The Extron MVP and SVS Control Program main screen appears, as shown below. The screen display includes controls for video inputs, audio inputs, picture adjustment controls, and a graphic representation of the window images.

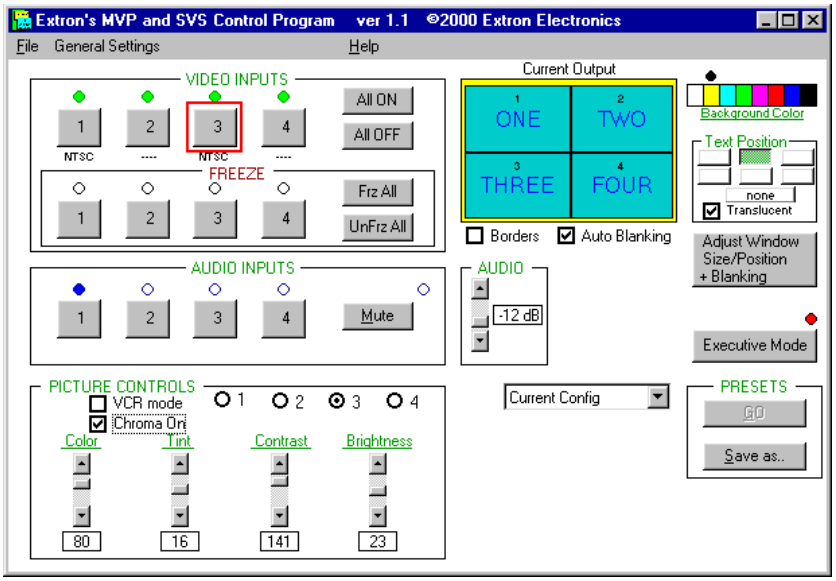


Figure 4-1 — MVP and SVS Control Program main screen

3. Using normal Windows controls, you can perform many of the same adjustments as from the MVP 104GX front panel. The illustration below, which shows the four input windows, is an example of the window adjustment screen that appears after the Adjust Window button is selected from the previous MVP and SVS Control Program main screen. The window sizes, position, priorities, text, text placement, blanking around images, and background colors can be adjusted from this window.

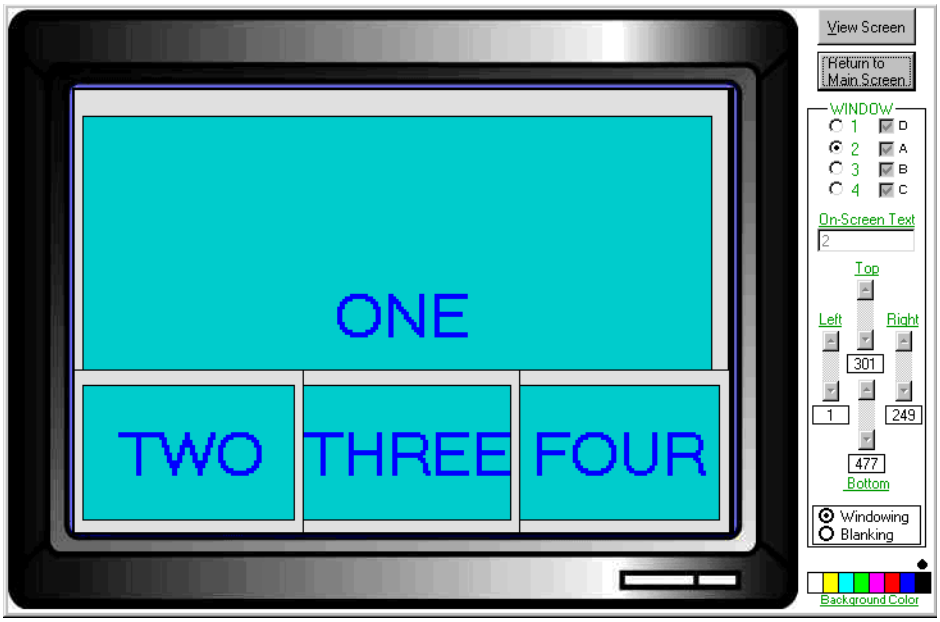


Figure 4-2 — Window adjustment example screen

For information about program features, you can access the help program in any of the following ways:

- From the Extron Electronics group folder, double-click on the MVP+SVS Help icon.
- From within the MVP and SVS Control Program, click on the Help menu on the main screen.
- From within the MVP and SVS Control Program, press the F1 key for context-sensitive Help.

MVP+SVS Help

Chapter Five

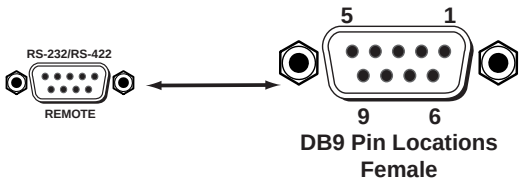
Programmer's Guide

Remote Control Port (RS-232/RS-422)

Host-to-MVP 104GX Communications

Remote Control Port (RS-232/RS-422)

The MVP 104GX RS-232/RS-422 port connector is used to connect to a host or external controlling device, such as a computer or control system which can generate the proper command codes and recognize the MVP 104GX responses.



NOTE *The MVP 104GX comes from the factory configured for RS-232. To set the MVP 104GX for RS-422 operation, see "Configuring the MVP 104GX for RS-422" in the appendix.*

The RS-232/RS-422 connector is a 9-pin D female (see illustration above) with the following pin designations:

Pin	RS-232	Description	RS-422	Description
1	—	not used	Tx(-)	Transmit data (-)
2	Tx	Transmit data	Tx(+)	Transmit data (+)
3	Rx	Receive data	Rx(+)	Receive data (+)
4	—	not used	Rx(-)	Receive data (-)
5	Gnd	Signal ground	Gnd	Ground
6	—	not used	—	not used
7	—	not used	—	not used
8	—	not used	—	not used
9	—	not used	—	not used

The protocol is 9600 baud, 8-bit, 1 stop bit, no parity, and no flow control.

Commands and responses for programming the MVP 104GX from a host system connected to the RS-232/RS-422 port are listed on the following pages.

Host-to-MVP 104GX Communications

The MVP 104GX accepts SIS™ (Simple Instruction Set™) commands through the RS-232/RS-422 port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each MVP 104GX response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

MVP 104GX-initiated messages

When a local event occurs, such as a front panel operation, the MVP 104GX responds by sending a message to the host. The MVP 104GX-initiated messages are listed below (underlined).

(c) Copyright 2000, Extron Electronics, MVP 104GX, Vx.xx↵

The copyright message is initiated by the MVP 104GX when it is first powered on. Vx.xx is the firmware version number.

RECONFIG↵

The Reconfig message is initiated by the MVP 104GX when a local event takes place, such as a front panel operation. The MVP responds by sending an unsolicited response (Reconfig##) to the Host. See *MVP 104GX-generated unsolicited responses* at the end of the command/response table.

Using the command/response table

The command/response table is shown on the following pages. Lower case characters are acceptable in the command field only where indicated. Symbols are used throughout the table to represent variables in the command/response fields. Symbol definitions are shown below, and an ASCII-to-hexadecimal (HEX) conversion table is shown in *figure 5-1*. Command and response examples are shown throughout the command/response table.

Symbol definitions:

↵ = CR/LF • = space ← = CR Esc = escape

X1 = Inputs, 1 - 4

X2 = Audio inputs, 0 - 4

X3 = Audio gain, 0 thru 9 (dB)

X4 = Audio attenuation, 1 thru 15 (dB)

X5 = Numerical value, -15 thru +9

X6 = User presets, #1 thru 24

X7 = Factory patterns, #51 thru 70 (for 1 - 20)

X8 = Windowing values (various)

X9 = Picture contrast, 0 - 150

Xa = Picture brightness, 0 - 50

Xb = Picture tint, 0 - 32

Xc = Picture color, 0 - 100

Xd = 1 (on) or 0 (off)

Xe = Background color, 0 thru 7 (0: white, 1: yellow, 2: cyan, 3: green, 4: magenta, 5: red, 6: blue, 7: black)

Xf = Window text, 16 characters (no lower case letters)

Xg = Blanking values, 0 thru 16

Xh = Video type, 0: no input; 1: NTSC 3.58; 2: PAL; 3: NTSC 4.43; 4: SECAM

Xi = Video output type, 1: NTSC; 2: PAL

Xj = Video input selection, 1: Auto; 2: Video (Composite); 3: S-video

Xk = Text placement, 0: off; 1: top left; 2: top center; 3: top right; 4: bottom left; 5: bottom center; 6: bottom right

Xl = Text style, 0: solid; 1: translucent

ASCII to HEX Conversion Table																Esc 1B		CR ØD		LF ØA	
Space	2Ø	!	21	"	22	#	23	$	24	%	25	&	26	'	27						
(	28	)	29	*	2A	+	2B	,	2C	-	2D	.	2E	/	2F						
Ø	3Ø	1	31	2	32	3	33	4	34	5	35	6	36	7	37						
8	38	9	39	:	3A	;	3B	<	3C	=	3D	>	3E	?	3F						
@	4Ø	A	41	B	42	C	43	D	44	E	45	F	46	G	47						
H	48	I	49	J	4A	K	4B	L	4C	M	4D	N	4E	O	4F						
P	5Ø	Q	51	R	52	S	53	T	54	U	55	V	56	W	57						
X	58	Y	59	Z	5A	[	5B	\	5C	]	5D	^	5E	_	5F						
`	6Ø	a	61	b	62	c	63	d	64	e	65	f	66	g	67						
h	68	i	69	j	6A	k	6B	l	6C	m	6D	n	6E	o	6F						
p	7Ø	q	71	r	72	s	73	t	74	u	75	v	76	w	77						
x	78	y	79	z	7A	{	7B	|	7C	}	7D	~	7E	DEL	7F						

Figure 5-1 — ASCII-to-hexadecimal conversion table

COMMAND/RESPONSE TABLE

COMMAND	ASCII	RESPONSE	DESCRIPTION
Left Edge Size			
Left edge size right	X1+H	X1Hph X8 ↵	Size left edge of input X1 image to the right
Left edge size left	X1–H	X1Hph X8 ↵	Size left edge of input X1 image to the left
Top Edge Size			
Top edge size down	X1+/	X1Vph X8 ↵	Size top edge of input X1 image down
Top edge size up	X1–/	X1Vph X8 ↵	Size top edge of input X1 image up
Right Edge Size			
Right edge size right	X1+:	X1Hsz X8 ↵	Size right edge of input X1 image to the right
Right edge size left	X1–:	X1Hsz X8 ↵	Size right edge of input X1 image to the left
Bottom Edge Size			
Bottom edge size down	X1+;	X1Vsz X8 ↵	Size bottom edge of input X1 image down
Bottom edge size up	X1–;	X1Vsz X8 ↵	Size bottom edge input X1 image up
Top Blanking			
Specific value	X1*Xg=T	X1Blt Xg ↵	Sets input X1 top blanking to Xg
Increment up	X1+=T	X1Blt Xg ↵	Increment input X1 top blanking one step
Decrement down	X1–=T	X1Blt Xg ↵	Decrement input X1 top blanking one step
Bottom Blanking			
Specific value	X1*Xg=B	X1Blb Xg ↵	Sets input X1 bottom blanking to Xg
Increment up	X1+=B	X1Blb Xg ↵	Increment input X1 bottom blanking one step
Decrement down	X1–=B	X1Blb Xg ↵	Decrement input X1 bottom blanking one step
Left Blanking			
Specific value	X1*Xg=L	X1Bll Xg ↵	Sets input X1 left blanking to Xg
Increment up	X1+=L	X1Bll Xg ↵	Increment input X1 left blanking one step
Decrement down	X1–=L	X1Bll Xg ↵	Decrement input X1 left blanking one step
Right Blanking			
Specific value	X1*Xg=R	X1Blr Xg ↵	Sets input X1 right blanking to Xg
Increment up	X1+=R	X1Blr Xg ↵	Increment input X1 right blanking one step
Decrement down	X1–=R	X1Blr Xg ↵	Decrement input X1 right blanking one step

COMMAND	ASCII	RESPONSE	DESCRIPTION
Contrast			
Specific value	X1 * X9 ^	X1 Con X9 ↵	Sets input X1 contrast to X9
Increment up	X1 +^	X1 Con X9 ↵	Increment input X1 contrast one step
Decrement down	X1 –^	X1 Con X9 ↵	Decrement input X1 contrast one step
Brightness			
Specific value	X1 * Xa Y	X1 Brt Xa ↵	Sets input X1 brightness to Xa
Increment up	X1 +Y	X1 Brt Xa ↵	Increment input X1 brightness one step
Decrement down	X1 –Y	X1 Brt Xa ↵	Decrement input X1 brightness one step
Color			
Specific value	X1 * Xc C	X1 Col Xc ↵	Sets input X1 color to Xc
Increment up	X1 +C	X1 Col Xc ↵	Increment input X1 color one step
Decrement down	X1 –C	X1 Col Xc ↵	Decrement input X1 color one step
Tint			
Specific value	X1 * Xb T	X1 Tin Xb ↵	Sets input X1 tint to Xb
Increment up	X1 +T	X1 Tin Xb ↵	Increment input X1 tint one step
Decrement down	X1 –T	X1 Tin Xb ↵	Decrement input X1 tint one step
Input Window Selection			
Window on	X1 b	X1 Blk 0 ↵	Sets input X1 window on
Window off	X1 B	X1 Blk 1 ↵	Sets input X1 window off
All windows on	b	Blk 0 ↵	Sets all windows on
All windows off	B	Blk 1 ↵	Sets all windows off
Freeze Window			
Enable freeze mode	X1 F	X1 Frz 1 ↵	Set input X1 freeze mode on (freeze current image)
Disable freeze mode	X1 f	X1 Frz 0 ↵	Set input X1 freeze mode off
Enable freeze all	F	Frz 1 ↵	Set freeze mode for all windows on
Disable freeze all	f	Frz 0 ↵	Set freeze mode for all windows off
Output Background Color			
Background color	1* Xe #	Bkg Xe ↵	Display background color Xe
Window Priority			
Window priority	X1 X1 X1 X1 ~	Pri X1 X1 X1 X1 ↵	Set priority of all input windows where the leftmost X1 corresponds to the window that is first in priority (on the top), the next X1 to the right is the window that is second in priority (just below the top), etc.
Audio Input Selection			
Audio selection	X2 $	Aud X2 ↵	Connect audio output to audio input X2, or no audio (X2 = 0)
Window Borders			
Borders on	K	Bdr 1 ↵	Enable window borders
Borders off	k	Bdr 0 ↵	Disable window borders
Write Window Name			
Write name	Esc N X1 Xf ←	Nam ↵	Display input X1 window name

COMMAND	ASCII	RESPONSE	DESCRIPTION	
Audio Channel Gain				
Audio gain	X1 * X3 G	In X1 •Aud= X5 ↵	Set audio gain for input X1 to X3	
Audio Channel Attenuation				
Audio gain	X1 * X4 g	In X1 •Aud= X5 ↵	Set audio attenuation for input X1 to X4	
View Audio Input Channel Gain				
View audio gain	X1 G	In X1 •Aud= X5 ↵	Display audio gain for input X1	
View audio gain	X1 g	In X1 •Aud= X5 ↵	Display audio gain for input X1	
User Preset Recall				
Recall user preset	X6 .	Rpr X6 ↵	Recall user preset X6	
User Preset Save				
Save user preset	X6 ,	Spr X6 ↵	Save user preset X6	
Factory Patterns Recall				
Recall factory pattern	X7 .	Rpr X7 ↵	Recall factory pattern X7	
Executive Mode				
Enable executive mode	X	Exe 1 ↵	Set executive mode on	Disable
executive mode	x	Exe 0 ↵	Set executive mode off	
VCR Mode				
Enable VCR mode	X1 D	X1 Det1 ↵	Set VCR mode for a window on	
Disable VCR mode	X1 d	X1 Det0 ↵	Set VCR mode for a window off	
Enable VCR mode for all	D	Det1 ↵	Set VCR mode for all windows on	
Disable VCR mode for all	d	Det0 ↵	Set VCR mode for all windows off	
Chroma				
Enable chroma	X1 J	X1 Kro1 ↵	Set chroma for a window on	
Disable chroma	X1 j	X1 Kro0 ↵	Set chroma for a window off	
Enable chroma for all	J	Kro1 ↵	Set chroma for all windows on	
Disable chroma for all	j	Kro0 ↵	Set chroma for all windows off	
Text Location				
Set text location	2* Xk #	Tlc Xk ↵	Set window text location	
Text Style				
Set text style	3* Xl #	Txs Xl ↵	Set window text style	
Autoblanking				
Set autoblanking	4* Xd #	Abl Xd ↵	Set window autoblanking	
Video Input Type				
Set video input type 1	1* Xj \	TpA Xj ↵	Specify video input type 1	
Set video input type 2	2* Xj \	TpB Xj ↵	Specify video input type 2	
Video Output Type				
Set video output type	0* Xi \	TpO Xi ↵	Specify composite video output type	
Query Firmware Version				
Query firmware version	Q/q	Ver x.xx ↵	Display firmware version	
Request Part Number				
Request part number	N/n	Nxx-xxx-xx ↵	Display Extron part number	

COMMAND	ASCII	RESPONSE
Request Information		
General	I/i	A|X2•Aud X5•Pri X1 X1 X1 X1•Bdr Xd•Bkg Xe•Exe Xd•Abl Xd•TpO Xi •TpA Xj•TpB Xj•Tlc Xk•Txs Xl ↵
Current picture control	X1I	T Xh•Aud X5•Col Xc•Tin Xb•Con X9•Brt Xa•Frz Xd•Blk Xd•Det Xd •Kro Xd•[Xf]↵
Current windowing	X1i	Hph X8•Hsz X8•Vph X8•Vsz X8•Blt Xg•Blb Xg•Bll Xg•Blr Xg ↵
User preset picture control	X6* X1I	T Xh•Aud X5•Col Xc• Tin Xb•Con X9•Brt Xa•Frz Xd•Blk Xd•Det Xd •Kro Xd•[Xf]↵
User preset windowing	X6* X1i	Hph X8•Hsz X8•Vph X8•Vsz X8•Blt Xg•Blb Xg•Bll Xg•Blr Xg ↵
Factory pattern picture control	X7* X1I	T Xh•Aud X5•Col Xc•Tin Xb•Con X9•Brt Xa•Frz Xd•Blk Xd•Det Xd •Kro Xd•[Xf]↵
Factory pattern windowing	X7* X1i	Hph X8•Hsz X8•Vph X8•Vsz X8•Blt Xg•Blb|Xg•Bll|Xg•Blr Xg ↵
General user presets	X6*0I	A|X2•Aud X5•Pri X1 X1 X1 X1•Bdr Xd•Bkg Xe•Exe Xd•Abl Xd• TpO Xi •TpA Xj•TpB Xj•Tlc Xk•Txs Xl ↵
General factory patterns	X7*0I	A|X2•Aud X5•Pri X1 X1 X1 X1•Bdr Xd•Bkg Xe•Exe Xd•Abl Xd• TpO Xi •TpA Xj•TpB Xj•Tlc Xk•Txs Xl ↵

Example responses to commands

1. Response to **Request general information** (I/i) command:

   A1•Aud+06•Pri2314•Bdr1•Bkg2•Exe0•Abl1•TpO2•TpA1•TpB2• Tlc3•Txs0 ↵

   Audio input selection (A) = input 1

   Audio gain (Aud) = +06

   Window priority (Pri) = 2314, where window 2 is on the top, followed by window 3, then window 1, and window 4 is on the bottom, if windows overlap.

   Window borders (Bdr) = 1 (on)

   Background color (Bkg) = 2 (cyan)

   Executive mode (Exe) = 0 (off)

   Autoblanking (Abl) = 1 (on)

   Video output type (TpO) = 2 (PAL)

   Video input 1 type (TpA) = 1 (auto)

   Video input 2 type (TpB) = 2 (composite)

   Text location (Tlc) = 3 (top right)

   Text style (Txs) = 0 (off, i.e. solid)

2. Response to **Request User preset picture control information** command (3*2I) with User preset = 3 and Input = 2:

T2•Aud+02•Col100•Tin22•Con95•Brt20•Frz0•Blk0•Det1
•Kro1•[FEW WORDS]↵

NOTE *The following response example refers to input 2.*

Video type detected (T) = 2 (PAL)
Audio gain (Aud) = +02dB
Picture color (Col) = 100
Picture tint (Tin) = 22
Picture contrast (Con) = 95
Picture brightness (Brt) = 20
Freeze window (Frz) = 0 (off, i.e. image not frozen)
Window blanking (Blk) = 0 (blanking off, i.e. window is visible)
Enable VCR mode (Det) = 1 (on)
Enable Chroma (Kro) = 1 (on)
Window text ([]) = FEW WORDS (user-defined text)

MVP 104GX error responses

When the MVP 104GX receives an SIS command and determines that it is valid, it performs the command and sends a response to the host device. If the MVP 104GX is unable to perform the command because the command is invalid or contains invalid parameters, the MVP 104GX returns an error response to the host. The error response codes are:

E01↵ — Invalid input number
E09↵ — Invalid function number (too large)
E10↵ — Invalid command
E11↵ — Invalid preset
E13↵ — Invalid value (out of range)

MVP 104GX-generated unsolicited responses

Whenever there is a front panel operation (only), the MVP 104GX responds by sending an unsolicited response (Reconfig##) to the Host. Use the 2 digit code ## to locate the event below.

Reconfig00 = More than one window configuration changed
Reconfig01 = Window 1's configuration changed
Reconfig02 = Window 2's configuration changed
Reconfig03 = Window 3's configuration changed
Reconfig04 = Window 4's configuration changed
Reconfig20 = Audio selection changed

Appendix

Reference Information

Configuring the MVP 104GX for RS-422

Specifications

Configuring the MVP 104GX for RS-422

The MVP 104GX comes configured from the factory for RS-232 communications. If an RS-422 configuration is required, follow the procedures below. The procedures involve removing the top cover, relocating the serial port ribbon cable, setting the jumper, and replacing the top cover.

Removing the top cover

The top cover of the MVP 104GX must first be removed to gain access to the ribbon cable and jumper.

1. Disconnect the power cord from the MVP 104GX.
2. If the MVP 104GX is rack mounted, remove the MVP from the rack.
3. Remove the fourteen screws which secure the top cover of the MVP 104GX, as shown in *figure A-1*.

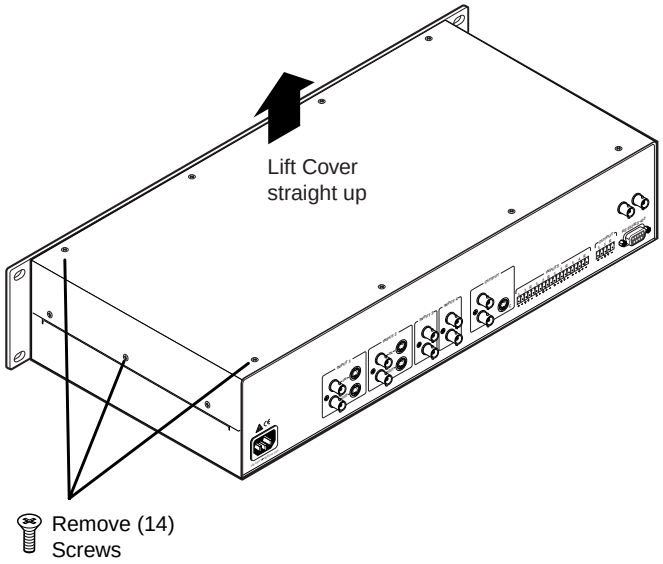


Figure A-1 — Top cover removal

4. Lift the cover straight up and set it aside.

Relocating the ribbon cable and setting the jumper

If the MVP 104GX is currently configured for RS-232 communication, the ribbon cable must be relocated and the jumper must be reset for RS-422 communication. See *figure A-2*.

1. Disconnect the ribbon cable from the RS-232 receptacle, noting that the red stripe of the cable is positioned relative to pin #1 of the receptacle.

NOTE *Both RS-232 and RS-422 receptacles are mounted with pin #1 located on the same side, relative to the circuit board.*

2. Reconnect the ribbon cable to the RS-422 receptacle, as shown in *figure A-2*. The red stripe of the ribbon cable must be positioned relative to pin #1 of the RS-422 receptacle.

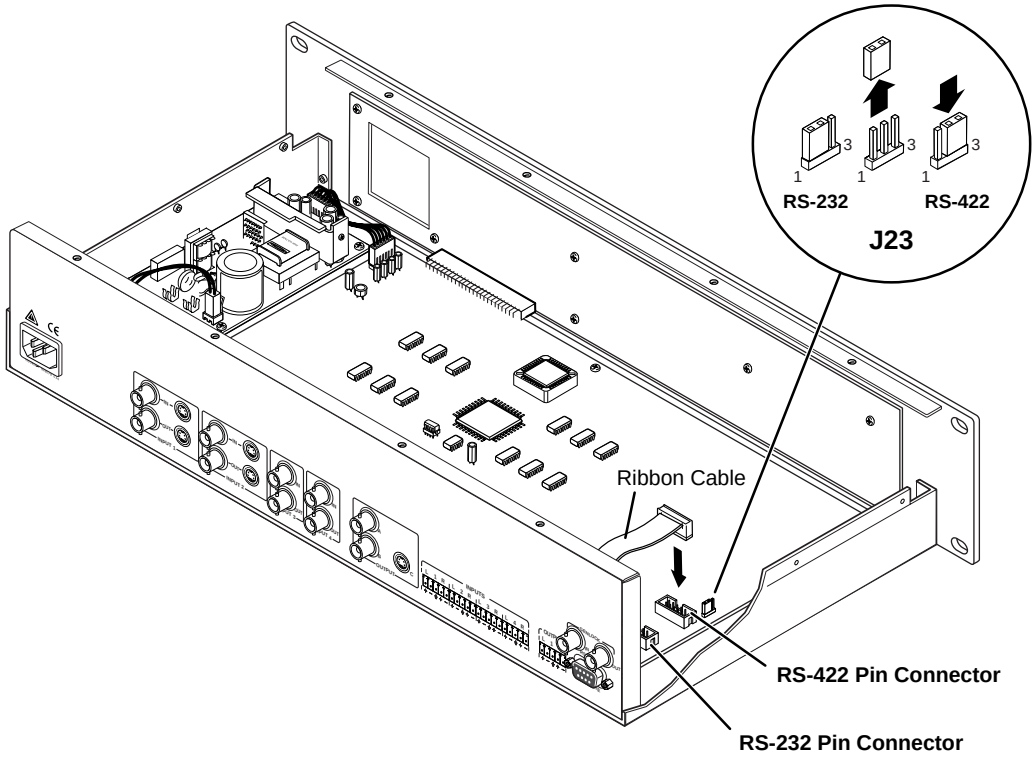


Figure A-2 — RS-232 to RS-422 cable and jumper positioning

3. Remove and replace the jumper on the alternate jumper position, as shown in *figure A-2*.

Replacing the top cover

1. Before replacing the top cover, be sure that all internal wiring is safely within the enclosure.
2. Carefully position the top cover and replace the fourteen screws which were previously removed.
3. Attach the power cord to the MVP 104GX and plug the cord into an AC power source. Check that the MVP 104GX is operating properly.
4. If the MVP 104GX is to be rack mounted, disconnect the power cord and install the MVP 104GX in a rack, then reattach the power cord.

Specifications — MVP 104GX

Video

Gain	Unity
Differential phase error	1.5º, 0 to 10 MHz
Differential gain error	1.5%, 0 to 10 MHz

Video input and loopthrough

Number/signal type	4 S-video, 8 NTSC/PAL composite video
Connectors	4 4-pin mini-DIN female ..... S-video 8 BNC female ..... composite video
Minimum/maximum level(s)	2.0V p-p
Impedance	75 ohms
Vertical frequency	50 Hz to 60 Hz

Video processing

Encoder	10 bit digital

Video output

Number/signal type	1 S-video, 2 composite video
Connectors	1 4-pin mini-DIN female ..... S-video 2 BNC female ..... composite video
Nominal level	S-video ..... 0.7V p-p Y, 0.288V p-p C (burst) Composite video ..... 0.5V to 1V p-p
Impedance	75 ohms

Sync

Standards	NTSC 3.58, PAL

Audio

Gain	Unbalanced 0dB, balanced +6dB
Frequency response	20 Hz to 20 kHz, ±0.05dB
THD + Noise	0.03% @ 1 kHz, 0.3% @ 20 kHz at rated maximum output drive (+19.5dBu input, +21dBu output, balanced/unbalanced)
S/N	>90dB, output +21dBu, balanced, at rated maximum output drive
Crosstalk	<-80dB @ 1 kHz
Stereo channel separation	>80dB @ 1 kHz
CMRR	>75dB @ 20 Hz to 20 kHz

Audio input

Number/signal type	4 stereo, balanced/unbalanced
Connectors	4 3.5 mm captive screw connectors, 5-pole
Impedance	>50 kohms unbalanced, 25 kohms balanced, DC coupled
Minimum level	-10dBu for full power out
Maximum input level	+19.5dBu (balanced/unbalanced) @ stated %THD+N
Input gain adjustment	-15dB to +9dB, adjustable per input via RS-232 or front panel

Audio output

Number/signal type	1 stereo, balanced/unbalanced

Connectors	1 3.5 mm captive screw connector, 5-pole
Impedance	50 ohms unbalanced, 100 ohms balanced
Gain error	±0.1dB channel to channel
Maximum level (Hi-Z)	>+21dBu, balanced at stated %THD+N
Maximum level (600 ohm)	>+15dBu, balanced at stated %THD+N

NOTE *0dBu = 0.775 volts (RMS).*

Control/remote — video processor

Serial control port	RS-232/RS-422, 9-pin female D connector
Baud rate and protocol	9600, 8-bit, 1 stop bit, no parity
Serial control pin configurations	2 = TX, 3 = RX, 5 = GND
Program control	Extron's control program for Windows® Extron's Simple Instruction Set™ – SIS™

General

Power	100VAC to 240VAC, 50/60 Hz, 40 watts, internal
Temperature/humidity	Storage -40° to +158°F (-40° to +70°C) / 10% to 90%, non-condensing Operating +32° to +122°F (0° to +50°C) / 10% to 90%, non-condensing
Rack mount	Yes
Enclosure type	Metal
Enclosure dimensions	3.4" H x 17.5" W x 9.5" D (2U high, full rack width) 8.6 cm H x 44.4 cm W x 24.1 cm D (Depth excludes connectors and knobs. Width excludes rack ears.)
Product weight	6.9 lbs (3.2 kg)
Shipping weight	13 lbs (5.9 kg)
Vibration	ISTA/NSTA 1A in carton (International Safe Transit Association)
Listings	UL, CUL
Compliances	CE, FCC Class A
MTBF	30,000 hours
Warranty	3 years parts and labor

NOTE *Specifications are subject to change without notice.*

FCC Class A Notice

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

Note: This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1230 South Lewis Street
Anaheim, CA 92805, USA

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Asia:

Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Japan:

Extron Electronics, Japan
Daisan DMJ Bldg. 6F,
3-9-1 Kudan Minami
Chiyoda-ku, Tokyo 102-0074
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

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